

## **11. B.E / B.Tech (Hons) and B.E / B.Tech minor**

**11.1** Students always have a passion or fascination for a particular field or a line of thinking or study and Honours Degree option enables the student to nurture this interest. Students shall obtain Honours degree by successful completion of additional courses in the 'FIRST APPEARANCE' itself. These additional courses are over and above the courses prescribed in the respective curriculum from 'FIFTH' semester onwards. Additional courses shall be either a 'CAPSTONE DESIGN PROJECT' or 'SIX ELECTIVE COURSES'.

- (i) Students shall earn '**EIGHTEEN**' credits and split up of credits shall be given in the respective curriculum.
- (ii) Eligibility for any student admitted under Clause 2.1 of this regulation to opt for the Honours degree is that, the student should earn a minimum CGPA of 7.0 in 'THIRD' and 'FOURTH' semesters together and also students should not have any history of arrears from first semester.
- (iii) Eligibility for any student admitted under Clause 2.2 & Clause 2.3 of this regulation to opt for the Honours degree is that, the student should earn a minimum CGPA of 7.0 in 'THIRD' and 'FOURTH' semesters together without any backlog arrears in Third and Fourth semesters.

## **11.2 Capstone Design Project for 'HONOURS' Degree**

- (i) Capstone Design project provides an opportunity to work in a team to design and develop a product, focusing to evolve solutions for real-time problems, starting from Problem definition, Specification formulation within given constraints, Review of design process and design ideation, Human factors, Market research, Product and patent research, fabrication considerations, Safety and risk assessment, Liability and ethics, Environmental and sustainability considerations, Proof-of-concept methods, Codes and Standards, etc. and finally to test prototype(s).
- (ii) A group comprising of 4 to 6 students, spread over minimum of two departments and maximum of three departments, shall opt for Capstone Design Project in 'THREE PHASES' from V to VII semester, in addition to the courses as prescribed in the curriculum. It is mandatory that students from at least TWO departments shall be a part of the project group and the number of students from each department shall be at least TWO.

- (iii) A Mentor shall be identified by the students from any one of the participating Department. Head of the Department of the Mentor's Department with approval of the Head of the Institution, shall constitute a Project Review Committee (PRC) consisting of Mentor, one faculty – from the department of the students (other than the Mentor's Department) in the group and one expert from industry in the relevant field. Student shall also identify Co- Mentor(s) from the participating department(s).
- (iv) During the Capstone Design Project, the student groups are encouraged to participate in events such as Hackathon, Industrial Expo to showcase and pitch their inventions.
- (v) Evaluation of Capstone Design Project is by continuous assessment (Three periodical reviews) in each semester by the PRC and Viva-voce examination at the end of each semester. Viva-Voce examination shall be conducted with panel of Internal examiners (PRC) and ONE external examiner. Weightage for Continuous assessment is 60% and for project report evaluation along with Viva-voce examination is 40%.
- (vi) Every student in the group shall secure a minimum 45% of marks in Project report evaluation & viva-voce examination and also obtain a 50% of total marks in the Continuous assessments
- (vii) (Project report evaluation & viva-voce examination) for getting 'PASS' in the particular phase of Capstone Design Project. Upon successful completion of the particular phase, the students shall be allowed to proceed to the next phase. In case, if any student in the group is not able to secure 'PASS' as prescribed above, the student shall discontinue from the Capstone Design Project and shall not associate with the Capstone Design Project furthermore.
- (viii) After earning '**EIGHTEEN**' credits through the successful completion of the Capstone Design Project (CDP), 'HONOURS' shall be conferred along with 'Certificate of Appreciation' to the students, who secure 8.50 or higher CGPA, without any history of arrears. If the student in the group, after successful completion of Capstone Design Project secures less than 8.50 CGPA, 'HONOURS' degree shall not be conferred. However, the result of Capstone Design Project shall feature in the Grade sheet and a 'Certificate of Appreciation' shall be issued to those students.

### **11.3 Six Elective Courses for ‘HONOURS’ Degree**

- (i) Students shall opt for ‘Honours’ Degree by undergoing ‘SIX’ additional elective courses from the Honours vertical as listed from V to VII semester as listed in the respective curriculum. The student shall earn ‘EIGHTEEN’ additional credits through the course works, which are related to the major discipline of study. Evaluation and ‘PASS’ requirement of these courses is as per Clauses 12.1 to 12.4 and 14 for Theory & Laboratory Integrated Theory courses respectively.
- (ii) On successful completion of six elective courses, ‘HONOURS’ shall be conferred to the students, who secure a CGPA of 8.50 or higher, without any history of arrears. If the student after successful completion of ‘SIX’ courses secures less than 8.50 CGPA, ‘HONOURS’ degree shall not be conferred.
- (iii) If the student decides to opt out of Honours Degree, after successful completion of certain number of course work(s), these course(s) shall be treated as equivalent to PE Course(s). In such case, the student shall be permitted to drop the equal number of PE Course(s).
- (iv) If the student successfully completes more number of PE Course(s), over and above the mandatory PE course(s) as prescribed in the curriculum, the courses with higher grades shall be considered for the calculation of CGPA. Remaining courses shall be only printed on the grade sheet and grade obtained in these courses shall not be considered for computation of CGPA.

### **11.4 Minor Degree**

- (i) Students always have a passion to acquire knowledge apart from the discipline of the programme, making students more versatile. Students shall be awarded with minor degree upon successful completion of additional courses over and above the courses as prescribed in the respective curriculum from ‘FIFTH’ semester onwards.
- (ii) Students shall earn ‘EIGHTEEN’ credits and split up of credits shall be prescribed in the respective curriculum.
- (iii) Eligibility for any student admitted under Clause 2.1 of this regulation to opt for the Minor degree is that, the student should earn a minimum CGPA of 7.0 in ‘THIRD’ and ‘FOURTH’ semesters together and also students should not have any history of arrears from first semester.

- (iv) Eligibility for any student admitted under Clause 2.2 & Clause 2.3 of this regulation to opt for the Minor degree is that, the student should earn a minimum CGPA of 7.0 in 'THIRD' and 'FOURTH' semesters together without any backlog arrears in Third and Fourth semesters.
- (v) A student shall register for a 'Minor' degree, from the V semester by registering basket of courses as prescribed in the curriculum of the UG Programme offered by the department other than the parent department of the student. Evaluation and 'PASS' requirement of these courses is as per Clauses 12.1 to 12.4 and 14 for Theory & Laboratory Integrated Theory courses respectively.
- (vi) In order to get a Minor Degree, a student shall successfully complete the basket of courses as prescribed in the curriculum of the Department offering the Minor Degree and earn 'EIGHTEEN' additional credits. Grades obtained in the basket of courses shall also be considered for computation of CGPA, along with the courses in the curriculum for the programme (mainstream).
- (vii) If the student decides to opt out of Minor Degree, after successful completion of certain number of course(s), these course(s) can be treated as equivalent to OE Course. In such case, the student shall be permitted to drop the equal number of OE course.
- (viii) If the student successfully completes more number of OE Course over and above the courses prescribed in the curriculum, the courses with higher grades shall be considered for the computation of CGPA. Remaining courses shall be only printed on the grade sheet and grade obtained in these courses shall not be considered for computation of CGPA.
- (ix) Minor Degree shall be reflected in the degree certificate as "B. E., / B. Tech., in XYZ Engineering with Minor in ABC", where 'XYZ' is the Major Discipline of study and 'ABC' is the Discipline in which Minor Degree is offered.

**11.5** The Departments will be offering the following Honours / Minor program in emerging areas under the respective UG Degree Programme as given in the table IV. Students are expected to successfully complete any 6 courses additionally and earn 18 credits.

Table IV - Honours / Minor program in emerging areas offered

Sl. No	Emerging Areas	Programmes eligible for Honours	Programmes eligible for Minor
1.	Smart Cities	B.E – CIVIL , EEE	All other UG branches.
2.	Infrastructure Engineering	B.E - CIVIL	All other UG branches.
3.	Microgrid Technologies	B.E - EEE	All other UG branches.
4.	Electric Vehicles	B.E- EEE, MECH, B.Tech - AGRI	All other UG branches.
5.	Robotics	B.E- ECE, EEE, MECH	B.E - BME, CIVIL, CSE, CSE (AI&ML), B.Tech - AGRI, AI&DS
6.	3D Printing	B.E- CIVIL, MECH	B.E - BME, CSE, CSE (AI&ML), ECE, EEE, B.Tech - AGRI, AI&DS
7.	Artificial Intelligence and Machine Learning	B.E - CSE, CSE (AI&ML), ECE , EEE B.Tech – AI&DS	B.E - CIVIL, MECH, BME, B.Tech AGRI
8.	Cyber Security	B.E - CSE, CSE (AI&ML), ECE , EEE B.Tech – AI&DS	B.E - CIVIL, MECH, BME, B.Tech AGRI
9.	Block chain		
10.	Data Science		
11.	Internet of Things (IoT)		
12.	Virtual Reality & Augmented Reality	B.E CSE, CSE (AI&ML), B.Tech – AI&DS	B.E - BME, CIVIL,ECE, EEE, MECH , B.Tech - AGRI
13.	Precision Health Technology	BME	All other UG branches.
14.	Green Technology and Sustainability Engineering	B.E- CIVIL	All other UG branches.
15.	Innovation, Entrepreneurship and Venture Development	-	B.E - BME, CIVIL, CSE, CSE (AI&ML), ECE, EEE, MECH, B.Tech - AGRI, AI&DS
16.	VLSI Design & Technology	-	B.E - BME, CIVIL, CSE, CSE (AI&ML), ECE, EEE, MECH, B.Tech - AGRI, AI&DS

### 11.6 Procedure for the Enrolment:

The students have to register for this Honors / Minor program through web portal as per the procedure laid down by the institute and approved by the Head of the Institute. The selection of Honors / Minor program shall be done based upon the

interest of the students. The respective Heads of the Departments offering the honors / Minor program will approve the list of students.

**11.7** The students can earn a maximum of 6 credits out of 18 credits through online mode preferably through SWAYAM NPTEL platform. The equivalent NPTEL courses and their corresponding credits will be approved by the Department with the prior approval from the Head of the Institution and the Board of Studies and the same can be used to drop only the corresponding Honours / minor course. The online course (NPTEL) should be completed with not less than B+ Grade in advance to drop a corresponding honours course.

**11.8 Cancellation of the programme:**

i. If a student fails in course(s) of regular degree program and successfully completes the course(s) of Honours / Minor in a semester, his/her registration to the Honours / Minor will be cancelled automatically. However, the grades obtained in the successfully completed Honours / Minor course(s) during current and previous semester(s) will be considered in the respective GPA, eventually considered in CGPA also.

ii. If a student fails in course(s) of the Honours / Minor and successfully completes the course(s) of his regular degree program in a semester, his/her registration to the Honours / Minor will be cancelled automatically. However, the grades obtained in the successfully completed Honours / Minor course(s) during previous and current semester(s) will be considered in the respective GPA, eventually considered in CGPA also.

iii. If a student fails both in course(s) of his regular degree program and course(s) of the Honours / Minor in a semester, his/her registration to the Honours / Minor will be cancelled automatically. However, the grades obtained in the successfully completed Honours / Minor course(s) during previous semester(s) will be considered in the respective GPA, eventually considered in CGPA also.

iv. If a student successfully completes both course(s) of his regular degree program and course(s) of the Honours / Minor in a semester, his/her registration to the Honours / Minor will be continued automatically. The grades obtained in the successfully completed Honours / Minor course(s) during current and previous semester(s) will be considered in the respective GPA, eventually considered in

CGPA also. The student will be awarded Honours / Minor as per clause.

v. If a student wishes to withdraw from Honours / Minor during any semester, he/she can be permitted but the grades of successfully completed Honours / Minor course(s) during previous semester(s) will be included in the respective GPA and eventually considered in overall CGPA also.

### **11.9 Dropping of electives:**

The registration of Honours / Minor program shall get cancelled vide clause 5.9 (i – iii) and the student can also withdraw from Honours / Minor program as per clause 5.9 (v). After the cancellation / withdrawal, if the student wishes, he / she can use the credits of the successfully completed Honours / Minor courses to drop any two Allied / Open elective courses as per the following conditions. However, if a student has successfully completed more than two honours / Minor courses at the time of honours / Minor cancellation / withdrawal, such courses will be mentioned in the Semester Grade statement but only the courses with higher Grades will be considered for the final CGPA calculation in the Consolidated Grade statement.

- i. The students who have opted Minor degree program (clause 5.5) can drop only the Allied Elective courses.
- ii. The students who have opted Honours with specialization / Honours degree program (clause 5.4 / clause 5.3) can drop the Open / Allied Elective courses.

**11.10** New Honours / Minor in emerging areas may be introduced by the department / institution at any time depending upon the requirement after getting approval from the concerned Board of Studies, Academic Council and Governing Body.